FIG. 1

FIG. 2

FIG. 3

MPU

SRAM

ANALOG

FIG. 4(a)

KIND

LOT

WAFER ID

DATE AND TIME

CHIP

INSPECTION AREA NO.

4

WAFER MAP

DETECTION OPTICAL SYSTEM PARAMETERS

CELL-AREA SETTING SCREEN

IMAGE PROCESSING PARAMETERS

6

5

FIG. 4(b)

KIND

LOT

WAFER ID

DATE AND TIME

CHIP

INSPECTION AREA NO.

7

4

WAFER MAP

DETECTION OPTICAL SYSTEM PARAMETERS

CELL-AREA SETTING SCREEN

IMAGE PROCESSING PARAMETERS

5

FIG. 5

FIG. 6(a)

KIND
LOT
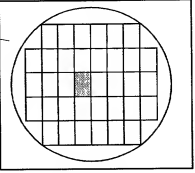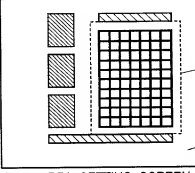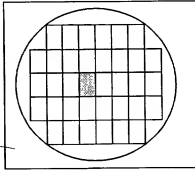WAFER ID

DATE AND TIME
CHIP
INSPECTION
AREA NO.

5

4
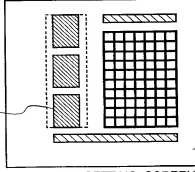
WAFER MAP

DETECTION OPTICAL
SYSTEM PARAMETERS

CELL-AREA SETTING SCREEN

IMAGE PROCESSING
PARAMETERS

FIG. 6(b)

10

11

10

9

10

5

FIG. 7

FIG. 8(a)

FIG. 8(b)

SCALE-UP

SCALE-UP

FIG. 8(c)

31

FIG. 9

FIG. 10

WAFER TO BE INSPECTED
KIND
PROCESS

IMAGE DETECTION PARAMETERS

IMAGE PROCESSING PARAMETERS

CHIP LAYOUT

SETTING OF INSPECTION AREA

A

B

C

D

FIG. 11(a)

21
22

SCALE-UP

FIG. 11(b)

22
23

FIG. 11(c)

21
22

☐ DENSITY OF WIRING IS LOW
☐ DENSITY OF WIRING IS MEDIUM
▨ DENSITY OF WIRING IS HIGH

FIG. 12(a)

21
22
SCALE-UP

FIG. 12(b)

22
23

FIG. 12(c)

☐ DENSITY OF WIRING IS LOW
☐ DENSITY OF WIRING IS MEDIUM
▨ DENSITY OF WIRING IS HIGH

FIG. 12(d)

23
22
24
25

FIG. 13

IMAGE DETECTION PARAMETERS

IMAGE PROCESSING PARAMETERS

18

CHIP LAYOUT

SETTING OF INSPECTION AREA

19d

19b

26

19c

20

19a

19

○ DEFECT

△ FALSE REPORT

FIG. 14

FIG. 15

WAFER TO BE INSPECTED

KIND

PROCESS

SEARCH FOR INSPECTION PARAMETERS

IMAGE DETECTION PARAMETERS

IMAGE PROCESSING PARAMETERS

CHIP LAYOUT

SETTING OF INSPECTION AREA

A

B

C

D

FIG. 16

FIG. 17

FIG. 18

29
LAYOUT DATA

TRIAL INSPECTION
(ADD LAYOUT CHARACTERISTICS) — 300

REVIEW (REGISTER LAYOUT
CHARACTERISTICS OF FALSE-
REPORT SOURCE PATTERN) — 301

30
FALSE-REPORT
SOURCE DB

INSPECTION
(DETECT DEFECT CANDIDATE) — 302

COMPARE LAYOUT CHARACTERISTICS — 303
OF THE DEFECT CANDIDATE WITH
FALSE-REPORT SOURCE

ARE THE
LAYOUT CHARACTERISTICS — 304
REGISTERED ?   NO

YES

NO OUTPUT   OUTPUT

FIG. 19

FIG. 20

FIG. 21

WAFER TO BE INSPECTED
KIND
PROCESS

PARAMETER ADJUSTMENT
CONDITIONS
DENSITY OF [   ] OR LESS
DEFECT

INITIAL VALUES OF IMAGE
DETECTION PARAMETERS

INITIAL VALUES OF IMAGE
PROCESSING PARAMETERS

CHIP LAYOUT

SETTING OF INSPECTION AREA

A

B

C

D

FIG. 22

SET INSPECTION AREA — S231

↓

SET DETECTION OPTICAL SYSTEM CONDITIONS — S232

↓

CHECK IMAGE QUALITY ? — S233 — BAD

↓ GOOD

SET IMAGE PROCESSING CONDITIONS — S234

↓

TRIAL INSPECTION — S235

↓

REVIEW — S236

↓

ARE FALSE REPORTS FEW ? — S237 — NO

↓ YES

ADJUSTMENT IS COMPLETED — S238

FIG. 23

(x_{11}, y_{11}) (x_{14}, y_{14}) (x_{31}, y_{31}) (x_{34}, y_{34})

FUNCTION
BLOCK 1

(x_{13}, y_{13})

FUNCTION
BLOCK 3

(x_{12}, y_{12})
(x_{21}, y_{21})

(x_{26}, y_{26})

(x_{25}, y_{25})

FUNCTION
BLOCK 2

(x_{22}, y_{22})

(x_{24}, y_{24}) (x_{32}, y_{32}) (x_{33}, y_{33})

(x_{23}, y_{23})

FIG. 24

LAYOUT DATA

FUNCTION BLOCK 1
- SHAPE, ARRANGEMENT OF BLOCK
  (COORDINATES OF VERTEX (x, y))
- ARRANGEMENT OF CELL IN BLOCK
- RELATION OF WIRING CONNECTION
  IN BLOCK
- I/O PORTION

FUNCTION BLOCK 2
- ----------
- ----------
- ----------

FUNCTION BLOCK 3
- ----------
- ----------
- ----------

FIG. 25

29

LAYOUT DATA

INQUIRE

SEARCH

```
INPUT KIND                          S261

READOUT AREA BY UNIT                S262
OF FUNCTION BLOCK

DISPLAY AREA                        S263

        REQUIRE          S264
        CHANGE ?            YES

              NO                  S265

                            CHANGE

DECIDE AREA                         S266
```

FIG. 26

S271
REPEAT FOR EACH OF FUNCTION BLOCKS

S272
SEARCH CONDITION OF OPTICAL SYSTEM OR CONDITION OF IMAGE PROCESSING IN CORRESPONDING TO FUNCTION BLOCK

S273
DISPLAY CONDITION OF OPTICAL SYSTEM OR CONDITION OF IMAGE PROCESSING

S274
REQUIRE CHANGE ?

YES

NO

S275
CHANGE

S276
DECIDE CONDITION

40

FUNCTION BLOCK	PARAMETER
1	* * *
2	* * *
3	* * *

WIDTH OF WIRING	PARAMETER
MORE THAN 0.2 μ m	* * *
0.1～0.2 μ m	* * *
LESS THAN 0.1 μ m	* * *

DATABASE OF INSPECTION PARAMETER

FIG. 27

FIG. 28

130

131

BINARIZATION

BINARIZATION

132

133

COMPARISON LOGICAL OPERATION

134b

134

134a

NOISE REMOVAL

135

FIG. 29

KIND ☐
LOT ☐
WAFER ID ☐

DATE AND TIME ☐
CHIP COORDINATES ☐
COORDINATES ☐

140

142

141

WAFER MAP

DETECTION OPTICAL
SYSTEM PARAMETERS

CELL-AREA SETTING SCREEN

IMAGE PROCESSING
PARAMETERS